

LASER

for Education Information Ecosystem



Concept Note



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Acronyms

CAN	Cross National Assessments
ECE	Early Childhood Education
EMIS	Educational Management Information Systems
FLA	Foundational Learning Assessments
ISCED	International Standard Classification of Education
MOE	Ministry of Education
NA	National Assessments
NSO	National Statistical Office
SDG	Sustainable Development Goals
TVET	Technical and Vocational Education and Training
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organization

LASER Assessment for Education Information Ecosystem

Concept Note

The LASER for Education Information Ecosystem serves as a cornerstone for UNESCO-UIS's mission to enhance education information systems on a global scale. It is aimed at enabling each country to develop its own data production capabilities and take advantage of all educational resources.

LASER plays a crucial role in identifying, analyzing, and harnessing full potential of existing education-related data sources, data production, reporting and use with the purpose to assess the full data cycle and its fitness to support policy decisions and monitoring progress of national education ministry's goals and international commitments such as the Sustainable Development Goal (SDG) 4.

This initiative seeks to map needs, identify gaps as well as to guide capacity building efforts based on a clearer understanding of the status of countries data ecosystems.

Objective

The LASER for Education Information Ecosystem Assessment (LASER from now on) emerges as a response to the increasingly complex demands for education information, aiming to highlight existing data gaps and strengthen education data in its multiple dimensions to plan priorities and monitor the state of education in countries. LASER helps to understand what educational resources are needed and which are available, and, therefore, could serve to guide informed actions to improve the capacity to produce education data. It also serves as a guide for countries to take advantage of various data sources to produce internationally comparable education indicators.

LASER's main objective is to help assess whether a country's education data ecosystem is collecting and leveraging the variety of data sources required for policy making and overall governance of the education sector. It serves as a link between education data and policy making, guiding on the combination of different data sources to help build trends and highlight aspects that a single data source cannot accomplish alone. As such, it is crucial that policymakers and education practitioners take advantage of all the education data system, including the sources of data that are not directly reporting to the Ministry of Education (MOE).

Reporting education data demands a multiplicity of sources of information and its effectiveness relies not only on multiple sources but also demands to look at the whole data production cycle, data production, data reporting and data use. Making the most of

the educational ecosystem involves combining sources to get a consistent story and filling data gaps¹.

The LASER acronym reflects the following characteristics of an education data ecosystem:

- **Learning** assessment system meets international standards.
- **Administrative** data on key indicators is regularly collected and covers major education issues and dimensions of inequality.
- **Survey** population system collects education indicators and dimensions of inequality on a regular basis.
- **Expenditure** is reported regularly for all sources of private and public expenditure.
- **Review** and Monitor Progress looks at the accountability through the publication of indicators reports, the elaboration of national plans and the monitoring of process through benchmarks.

To achieve these objectives, an Education Information System must be built based on:

1. Agreed-upon norms and standards at all stages of the process. Otherwise, data from different sources cannot be compared.
2. Harmonization of indicators calculation, for effective policymaking and monitoring.
3. Effective capacity to deliver data, which is related to a range of factors related to institutions and the availability of financial and human resources.

It is important to highlight that this tool is not intended to replace any of the available sources or other national indicators reports publications of any country. On the contrary, it adds value to the understanding of the challenges and the existing gaps by leveraging the multiple data sources available, with the goal of meeting both country-specific goals and Sustainable Development Goal (SDG 4). Problems with data could mean anything from errors or inaccuracies, non-adherence to international standards, incompleteness or data gaps, inconsistencies over time or imbalances.

¹ Some frequent examples of data deficiencies related to the SDG 4 refer to the absence of national learning assessments, lack of subnational or equity disaggregations for indicators, the absence of a survey or population census calendar, the lack of transparency or accessibility of education expenditure data, and the low capacity of countries to report on the progress of indicators towards established benchmarks.

Improving capabilities through data plans

LASER provides the opportunity to gain a comprehensive understanding of the situation of the education ecosystems capacity of each country to produce data in comparison to others within its region and the world. This, in turn, serves as an incentive for policymakers to aim to improve their statistical capabilities as data producers in collaboration with other partner institutions.

Therefore, LASER becomes a significant call to action for the development of data plans and, ultimately, for the improvement of educational indicators. The UIS works closely with more than 200 member countries and territories, regularly collecting education data to generate and improve information. LASER builds upon these and other data sources: it identifies them, compiles them, and establishes priorities that must be monitored globally.

However, it is crucial to emphasize that before crafting effective data plans, it is essential to comprehend what information and resources are available and, above all, what is lacking and what features need improvement. LASER will showcase issues, obstacles and challenges in data production, reporting and data use that countries may be facing, assessing not only the coverage of key education themes but also the timeliness, quality, and accuracy.

This aims to provide the necessary guidance to direct efforts and plan future data generation and delivery in accordance with the demands of the international community.

Key components

The education information ecosystem is powered by different sources of information either produced by countries and reported to the UIS or collected directly by the institute from publicly available official national documents. Each of these is characterized by variations in their coverage, timing, and collection methods, and together they provide a complete picture of the capacity to produce SDG 4 indicators.

(L) Learning assessments

Learning assessments encompass national school-based assessments specifically designed to measure targeted learning outcomes at specific ages or grades, that are considered significant for national policymakers. They also include initiatives that span across countries, either regionally or globally, following a shared framework and similar procedures to ensure comparable data on learning outcomes. In addition, assessment data can also be collected from households to measure basic skills. The information provided by learning assessments allows policymakers to know what students are learning and what needs to be improved. It also provides information on the process and context that enable learning. This first version of LASER includes detailed analysis only for cross-national assessments.

Table 1 - Learning assessments: assessment subcomponents

Total score component (L)

- Regularity of administration
- Coverage of major education issues (SDG 4 Indicators)
- Coverage of major dimensions of inequality
- Alignment with Internationally Accepted Standards

(A) Administrative data

Administrative data is derived from the information typically found in educational management information systems (EMIS) used by Ministries of Education (MOEs) for planning and management purposes. Administrative data that is normally available in MOEs from sources other than EMIS should ideally be linked to EMIS. This data is usually updated annually and encompasses various educational paths and levels, including early childhood education (ECE), primary, secondary, and higher education, as well as technical and vocational education and training (TVET). Countries regularly report this information to the UIS, which is collected and systematized through questionnaires.

Table 2 - Administrative data: assessment subcomponents

Total score component (A)

- ISCED mapping 2011 is available.
- Response to UIS Education Survey in the last 4 years
- Coverage of indicators in EMIS forms
- Coverage of major dimensions of inequality in EMIS forms
- Data and metadata collected in the National School Censuses Questionnaire(s) (selected education items)

(S) Survey population system

Surveys also play a significant role in providing data on access, participation, completion, literacy, educational attainment, and population. Multipurpose Household Surveys, Labor Force Surveys, and Regular Population Censuses vary in terms of coverage, frequency, objectives, and questionnaire design. Unlike administrative data, they are collected less frequently and by different organizations and countries (typically, from non-EMIS entities outside of MOEs).

Table 3 - Survey population system: assessment subcomponents

Total score component (S)

- *Household surveys*
Regularity (# in last 5 years)
Coverage of major dimensions of inequality
Alignment with Internationally Accepted Standards
Coverage of Major Education Issues (SDG 4 Indicators)
- *Labour force surveys*
Regularity (# in last 5 years)
Coverage of major dimensions of inequality
Coverage of Major Education Issues (SDG 4 Indicators)
- *Population census*
Regularity (every 10 years)

(E) Expenditure on education

Expenditure on education provides information on multiple sources of income and expenditure, including government expenditure on education. Some administrative data may originate from non-EMIS sources within ministries, typically from finance ministries in the case of public spending, and again these should ideally be linked to EMIS. Additionally, there are instances captured through expenditure surveys to account for private spending, usually conducted by National Statistical Offices (NSOs).

Table 4 - Expenditure on education: assessment subcomponents

Total score component (E)

- Response to UIS Education Survey in the last 4 years
- Government expenditure on education data is publicly available.
- Availability of private expenditure in the last 5 years

(R) Review and monitoring

Countries set goals regarding relevant SDG 4 indicators, which serve as useful benchmarks for assessing progress. This information is typically included in national plans or sector-specific educational plans. In addition, countries need to commit to publishing reports that reflect this progress or report to the UIS through specialized templates.

Table 5 - Review and monitoring: assessment subcomponents

Total score component (R)

- Benchmarks for education indicators published by the UIS.
- National education plans are publicly available and have quantitative target.
- National Indicators reports are published by ISCED level.



Weighting alternatives for LASER assessment summary

To provide an overall picture of the capacity of a country education data ecosystem to meet reporting needs, an aggregate score is produced synthesizing the scores of each component and their relative importance or weight. The first version of LASER is weighted according to the UIS criteria, the weight of the different components is critical for the final scoring and, therefore, calls for discussion and consensus, process the UIS will engage as next step. Some considerations about alternatives weights are discussed, nonetheless, to showcase its relevance.

How can this weighting system be developed? The following offers some guidance and considerations for answering this question.

First, what is the objective of LASER? The objective of LASER is to help assess whether a country's education data ecosystem is collecting and leveraging the variety of data sources required for policy making and overall governance of the education sector. This assessment is meant to help guide countries in identifying data needs and opportunities to use collected data to help them achieve national and SDGs goals.

Second, why is an aggregate score needed for LASER? An aggregate score helps in several ways including (1) to get attention from policy makers, (2) to make it easier to understand the overall picture that the assessment, through its many components, is providing, and (3) to act as a starting point for policy makers to understand weaknesses and set priorities for improving their countries' education data ecosystems. To elaborate on this latter point, improving an aggregate score becomes an obvious objective for policy makers, and improving this score naturally involves delving into how the score has been defined which in turn provides policy makers with what aspects of the data ecosystem are most important and of highest priority to improve. But as a result, the weighting system used to aggregate the scores of each individual component to an aggregate score becomes critical as it provides guidance for improving the aggregate score (see Table 6 which offers a draft set of weights used in working versions of the LASER country reports). In effect, the aggregate score is not only useful for communicating findings but also provides guidance (through its definition) on what to prioritize in strengthening the data ecosystem.

Third, given the objective and need for an aggregate score, how can the relative importance of the constituent characteristics of the data ecosystem be identified and quantified? There are several different approaches to **developing a weighting system** that can inform the selection of weights.

1. Goal orientated: SDG target 4.1 calls for all children completing primary and secondary education that leads to relevant learning outcomes, and many countries have similar goals in education strategies and plans. The most critical aspects of data ecosystem to achieve these goals would likely have higher weights. For example, having data on completion rates and learning outcomes emerge as a top priority for achieving SDG 4.1. Having national goals and targets set for learning outcomes and completion rates would also be of high importance. The next question would be what are the data needed to identify strengths and weaknesses in the education system that contribute to learning and

completion rates? For example, disaggregating learning assessment and completion data and other measures of accessing education would be needed as well as data on factors that are relevant to the quality of education including teachers and financing. From this approach, the most critical points of data would be weighted more than those that are further down the results chain, to help guide policy makers on data priorities.

2. Consensus building: Another approach would be to leverage UNESCO’s convening power to bring together various stakeholders (including Member States, international organizations, etc.) and experts to help seek agreement on what are the most important aspects of LASER for weighting purposes. For example, there may be other aspects of education that emerge as critical through consensus building including measures of equity, inclusiveness, fairness of teacher salaries, and others that, while clearly contributing to the overarching goal of SDG 4.1 or those of the countries, may end up being emphasized less in an exercise aimed specifically at learning outcomes and completion rates.

3. Case examples: One question is what aspects of the education data ecosystems have been the most disruptive and driving of change in the past? For example, Germany’s “[PISA shock](#)”, in which German students were found to be performing lower than the OECD averages in reading, mathematics and science in the first round of PISA and which resulted in a significant policy response, demonstrates that the availability of international student assessment data is critical to an education data ecosystem having impact. Drawing on experience from a variety of countries, the data that has been most strongly associated with changing education in a country might receive higher weights than those that have not. In other words, this approach aims to rely on past examples and experience on what aspects of education data ecosystems have truly resulted in change.

4. Types of weighting: In addition to identifying what aspects of the data education system are the most important, there are different types of weighting to consider. For example, an additive approach might assign weights to different indicators and then a weighted average for example could be used to generate the aggregate score. But what about cases where characteristics are substitutable to a certain degree? For example, if a country had to choose, it might be preferable for a country to have an international student assessment versus a national student assessment but having either of these would be significantly better to having no assessment at all. In other words, a weighting scheme might consider having any learning assessment and then bonus points if the country also has an international assessment. Similar reasoning applies to having household survey derived indicators versus administrative data: having any measure of school participation would be far better than having none, and this might be rewarded more than having multiple sources. These issues are highly relevant because often countries have limited expertise and capacity to make significant changes to their education data ecosystems (e.g.: establishing a national assessment) and countries face clear tradeoffs in what can be achieved in the next three to five years.

Table 6. Weighting example for LASER for generating a weighted average of key components - and sub-components.

Description		Weight	
Key components	Sub-components	Key components	Sub-components
Learning assessments		0.14	
	Regularity of administration		0.20
	Coverage of major education issues (SDG 4 Indicators)		0.30
	Coverage of major dimensions of inequality		0.20
	Alignment with Internationally Accepted Standards		0.30
	Total		1.00
Administrative data		0.30	
	ISCED mapping 2011 is available		0.20
	Response to UIS Education Survey in the last 4 years		0.50
	Coverage of indicators in EMIS forms		0.10
	Coverage of major dimensions of inequality in EMIS forms		0.10
	Data and metadata collected in the National School Censuses		0.10
	Questionnaire(s) (selected education items)		0.10
	Total		1.00
Survey population system		0.21	
	Household surveys		0.50
	Regularity (# in last 5 years)		
	Coverage of major dimensions of inequality		
	Alignment with Internationally Accepted Standards		
	Coverage of Major Education Issues (SDG 4 Indicators)		
	Labour force surveys		0.25
	Regularity (# in last 5 years)		
	Coverage of major dimensions of inequality		
	Coverage of Major Education Issues (SDG 4 Indicators)		
	Population census		0.25
	Regularity (existence in the last 10 years)		
	Total		1.00
Expenditure on education		0.05	
	Response to UIS Education Survey in the last 4 years		0.60
	Government expenditure on education data is publicly available (availability in last 4 years)		0.15
	Availability of private expenditure in the last 5 years		0.25
	Total		1.00
Review and monitoring progress		0.30	
	Benchmarks for education indicators published by the UIS		0.70
	National education plans are publicly available and have quantitative target		0.15
	National Indicators reports are published by ISCED level		0.15
	Total		1.00
Total		1.00	